

## Introduction and Overview

This report presents the results of a preliminary Phase II subsurface investigation conducted by The Riley Group, Inc. (Riley) at the Silver Bay Logging (SBL) facility (hereafter referred to as the Site) located on the northeast corner of South Kenyon Street and 8<sup>th</sup> Avenue South, in Seattle, Washington (Figure 1). The Site includes five contiguous upland tax parcels, totaling about 3.29 acres. The Lower Duwamish Waterway adjoins the Site to the east.

The Site was used by SBL primarily for the storage and distribution of wood products and associated administrative functions. The Site was historically occupied by one gasoline service station, another gasoline/diesel refueling area, a boat building and repair business, a gravel covered miscellaneous storage yard, a slug bait manufacturer and several single family residences.

The report provides a preliminary analysis of Site soil and groundwater conditions. This report was not meant to specifically address off-shore environmental issues associated with the Duwamish Waterway (if any). The report presents a regulatory analysis of the environmental data for the Site, and provides a determination of whether the environmental conditions at the Site meet compliance with the requirements of the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Cleanup Regulations (WAC 173-340, Revised February 12, 2001).

## Background Information

In 2002, Riley was contracted by SBL to perform a Phase I Environmental Site Assessment (ESA) for the Site. Our Phase I ESA findings and conclusions were presented in our final report dated March 14, 2002, and are summarized below. The locations of former Site uses are shown in Figure 3.

- The Lower Duwamish Waterway was listed on the National Priorities List (NPL) by the United States Environmental Protection Agency (USEPA) due to contamination from decades of industrial activity conducted along and near the waterway.
- A USEPA site investigation report for the Lower Duwamish Waterway showed that three sediment samples collected just off-shore from the Site had elevated concentrations of various contaminants, including hexachlorobenzene, above the Washington State sediment quality standards.
- In 1974, one 5,000-gallon gasoline underground storage tank (UST), one 10,000-gallon diesel UST and associated pump island were installed somewhere in the general vicinity of the Site's shop building at 816 South Kenyon Street and a warehouse at 7814 8<sup>th</sup> Avenue South. The exact location of the former USTs is unknown. The former pump island was located between the 816 and 836 shops. No

Phase II Subsurface Site Investigation  
Silver Bay Logging, Seattle, Washington

Page 2

February 12, 2004  
Project #2003-232

documentation was found that indicated that the USTs have been removed. Furthermore, it was unknown whether or not the former fuel system (i.e., USTs, underground piping, pump islands, etc.) had adversely affected Site soil and groundwater quality.

- The Site was utilized by a boat building/repair business for approximately 17 years. It was concluded that the potential use, waste generation, handling and/or disposal of lead-based paints and wood treatment preservatives/solvents on-Site posed a potential threat to Site soil and/or groundwater quality.
- A small gasoline service station was located on the northern corner of the Site from at least 1929 to as late as 1937. No documentation was found that indicated that the USTs have been removed. It was unknown whether or not the former gasoline station activities (i.e., storage, use, handling of petroleum, solvent or other wastes) had adversely affected Site soil and groundwater quality.
- Over 20 single family residences occupied the Site during the early to mid-1900s, which may have utilized heating oil USTs. Riley concluded that the potential for abandoned heating oil USTs, or potential petroleum release, posed to threat to Site soil and/or groundwater quality.

## Purpose of the Report

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The purpose of this report is to present the findings of this preliminary Phase II subsurface investigation completed for the Site uplands. The scope of work was meant as an initial assessment regarding the upland environmental issues identified in our Phase I ESA dated March 14, 2002. The scope was not meant to specifically address the off-shore sediments or any associated environmental issues.

The Phase II scope of work was performed in general accordance with our *Preliminary Phase II Site Investigation Proposal*, executed on November 3, 2003, as well as our *Preliminary Phase II Site Investigation Work Plan*, dated November 26, 2003.

## Organization of the Report

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This report is organized to present basic information on Site features, conditions of the property, and to provide a summary of the soil and groundwater data collected from the Site presented with a regulatory analysis to evaluate the compliance with the requirements of the Ecology Model Toxics Control Act (MTCA) Cleanup Regulations (WAC 173-340, Revised February 12, 2001). Additional supporting documentation and referenced information for the report such as laboratory analytical reports and field logs are provided as Appendices A through E.

## Project Site Conditions

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The Site consists of 5 legal tax parcels identified in the King County Tax Assessor's records under the property identification numbers as follows:

- Tax parcel 7327903645 (northern parcel, 0.82 acre);
- Tax parcel 7327902520 (southern parcel, 1.91 acres);
- Tax parcel 7327902480 (central parcel, 0.11 acres);
- Tax parcel 7327902500 (central-southern parcel, 0.11 acres); and
- Tax parcel 7327902490 (central-northern parcel, 0.11 acres).

In addition, SBL leases a portion of the Site from the City of Seattle. The leased portion, approximately 0.23 acre, corresponds to the right-of-way for that portion of South Chicago Street that formerly extended east of 8<sup>th</sup> Avenue South. Please refer to Figure 2 for the tax parcel outlines.

## Property Description and Setting

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The Site is a relatively flat irregular-shaped, approximately 3.29-acre property located along the Lower Duwamish Waterway (Figure 2).

The Site, with the exception of the storage area on the southeastern corner, is paved or improved with buildings. The Site was paved in 1999. The Site is generally secured with chain link fence or "Ecology" blocks.

## Electromagnetic/Ground Penetrating Radar Survey

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On November 19 and 26, 2003, Riley performed a geophysical electromagnetic (EM)/ground penetrating radar (GPR) survey at the Site. The purpose of the EM/GPR survey was to attempt to identify any abandoned fuel USTs and/or other buried anomalies in the surveyed areas. The survey covered Site areas known to have had UST fuel systems. Copies of the geophysical reports are included in Appendix A.

Riley contracted Apollo Geophysics Corporation (Apollo) to conduct the initial EM/GPR survey on November 19, 2003. Site access was adequate, except for the vegetated area in the outdoor material storage area (southeastern portion of the Site), which limited the survey in that location.

Apollo traversed the Site with the EM instrument on approximate three- to five-foot line spacings, which produced a total of nine target areas (anomalies). The target areas were further investigated using GPR, which established a relative depth, size, and ground projection of the anomaly. Three of the anomalies, two on the northern portion of the Site and one on the southeastern corner of the Site, had GPR signatures possibly associated with USTs. The location of these three anomalies coincided with the Site's

former gasoline station (on the north) and in the gravel covered material storage yard (southeast corner of the Site). The six other anomalies had GPR signatures that may be associated with piping, concrete rubble, and/or metallic debris. Figure 4 shows the location of the geophysical anomalies.

Riley contracted Geo Recon International (Geo Recon) to complete the GPR survey in the southwestern portion of the Site on November 26, 2003. Two USTs had reportedly been installed in this area in 1974. Reinforced concrete is present in this area; therefore, an EM survey was not performed since the metal reinforcements would have interfered with the survey results. Geo Recon scanned the area in east-west lines with approximately four- to five-foot centers. GPR penetration was reportedly to a depth of 10 feet below ground surface (bgs). No evidence of any abandoned USTs were identified in this area.

*The geophysical survey technique provides good information on the location of possible USTs and other buried objects. However, because of the numerous variables involved in geophysical investigations, there is a possibility that some subsurface features may not be detected, including possible USTs. Other buried features, such as foundations, pipes, rubble, etc., may complicate the interpretation of the geophysical data.*

## Site Geology and Hydrogeology

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**Overview of the Project Area** - Boring logs for the Site vicinity indicated sand and silt with localized cobbles and gravel to a depth of at least 105 feet bgs. Static groundwater was typically reported at depth of 20 feet or less bgs.

**Project Site** - In general, Site soils to depths of two to three feet appeared to be fill and consisted of sandy gravels with cobbles and various debris (e.g., wood fragments). Beneath the fill were gray silty sand or sandy silt deposits to the maximum depth explored, which was 12 feet bgs. Static groundwater was also intercepted during drilling at depths ranging from approximately 6 to 10 feet bgs.

## Regulatory Analysis of Site Conditions under the Model Toxics Control Act (MTCA)

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Washington's hazardous substance cleanup law, the Model Toxics Control Act (RCW 70.105D) mandates that site cleanups protect human health and the environment. The MTCA Cleanup Regulation (WAC173-340) defines the approach for establishing cleanup requirements for individual sites, including the establishment of cleanup standards and selection of cleanup actions.

## Current and Proposed Use of the Site

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### Current Use

The Site is zoned for industrial use (IG2) and qualifies as an *industrial* property according to MTCA Section 173-240-745.

### Proposed Use

Riley assumes that the proposed land will remain industrial.

## Applicable MTCA Cleanup Standards for the Site

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The MTCA Soil and Groundwater Cleanup Levels used for comparisons with Site data are summarized below and are included in Tables 1 and 2.

Soil data obtained by our investigation are compared to the routine MTCA Method A Soil Cleanup Levels for Industrial Properties (WAC 173-340, Table 745-1).

Groundwater data obtained by our investigation are compared to the MTCA Method A Groundwater Cleanup Levels<sup>1</sup> (WAC 173-340, Table 720-1). MTCA provides no routine Method A Groundwater Cleanup Levels for Industrial Property.

*Method A cleanup standards have been adopted for specific purposes and are intended to provide conservative cleanup levels for sites undergoing routine site characterization or cleanup actions, or those sites with relatively few hazardous substances.*

*MTCA does provide options for establishing cleanup levels other than Method A. Cleanup levels under Method B or C are established using applicable state and federal laws and risk assessment equations and other requirements specified for each medium (soil, groundwater, air, surface water). Method B applies to unrestricted land use, while Method C applies to industrial properties. The result of Method B or C cleanup levels often, though not always, result in higher cleanup levels compared to Method A, while remaining protective of human health and the environment.*

*For some compounds evaluated in this investigation, no Method A cleanup levels have been established. In order to determine whether those compounds were present at levels that would be harmful to human health or the environment, the detected concentrations were compared to MTCA Method C cleanup levels.*

## Contaminants of Potential Concern (COPCs)

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Based on Site uses, Riley determined that the primary COPCs for the Site are:

- Gasoline total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and total xylenes (BTEX);
- Diesel and oil range TPH;

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<sup>1</sup> Based on being protective of drinking water as the most beneficial use.

- Halogenated volatile (HVOCs) and semivolatile organic compounds (SVOCs);
- Polychlorinated biphenyls (PCBs); and
- Toxic metals.

## Soils Investigation – Soil Quality at the Property

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On December 4 and December 12, 2003, and January 12, 2004, Riley advanced a total of 14 soil probes (SB-01 through SB-14) and two hand auger borings (HA-1 and HA-2) on-Site. Soil boring locations are shown in Figure 5. The soil probes were advanced with a truck-mounted hydraulic direct-push soil probe unit. Test probes were advanced until groundwater was encountered, typically at depths of 6 to 10 feet bgs. Soil boring logs are included in Appendix B. The soil boring location rationale is discussed below:

- **Former gasoline service station (north end of Site):** Three soil probes (SB-01 through SB-03) were advanced to depths of 7 feet bgs to determine if the former gasoline station activities had adversely affected Site soil. Based on field screening results, one soil sample (SBL-SB-02-6-6.5) was selected and analyzed for gasoline TPH, BTEX, diesel TPH, oil TPH and total lead.
- **Chemical storage and shop area:** Soil probe SB-04 was advanced to a depth of 7 feet bgs to determine if the chemical storage and minor engine repair activities had adversely affected the Site. Based on field screening results, one soil sample (SBL-SB-04-3-4) was selected and analyzed for gasoline TPH, BTEX, diesel TPH, oil TPH, SVOCs, RCRA metals and PCBs.
- **Upland Site Conditions Near Duwamish Waterway:** Soil probes SB-05 through SB-07 were advanced along the Duwamish Waterway to depths of 6 feet bgs. Soil samples collected in this area were meant to evaluate *background* soil conditions as well as testing for SVOCs, including hexachlorobenzene and 1,2,4-trichlorobenzene (previously detected by USEPA in the Lower Duwamish off-shore sediments). Two soil samples (SBL-SB-05-3-4 and SBL-SB-06-5-6) were selected and analyzed for HVOCs and SVOCs.
- **Suspect UST and Outdoor Material Storage Area:** Borings SB-08, HA-1 and HA-2 were advanced on the southeastern corner of the Site to evaluate whether historical material storage activities and/or the suspect UST identified by our geophysical survey had adversely affected Site soil quality. Three soil samples (SBL-SB-08-3-4 and 8-8.5 and HA2-3/4) were selected and analyzed for TPH, HVOCs, SVOCs, RCRA metals, and/or PCBs.
- **Former Pump Island Area:** Soil probe SB-09 was advanced near the former pump island between the 816 and 836 shops. Probe SB-09 was advanced to a depth of 10 feet bgs. No samples were submitted for chemical analysis since no evidence of impacts (e.g., odors or stained soil) was identified.
- **Former Ship Building and Repair Area:** Probes SB-10 and SB-11 were advanced north of the 816 shop to depths of 10 feet bgs. These probes were

advanced to determine whether Site soils had been impacted from former shipbuilding, painting, and repair activities. Soil sample (SBL-SB-11-3-4) was selected and analyzed for HVOCs, SVOCs, and RCRA metals.

- **Suspect UST Area (Southwest Site):** Probes SB-12, SB-13 and SB-14 were advanced to determine if the Site had been impacted by the former USTs and refueling activities. Two soil samples (SBL-SB-12-6-7.5 and SBL-SB-7-8) were selected and analyzed for gas TPH, BTEX, diesel TPH, and oil TPH.

**Soil Sample Collection** – A total of 35 discrete soil samples were collected from the soil borings. Soil samples were collected and visually inspected and/or field screened in the field at 1 to 3 foot sampling depths intervals. Soil sampling and drill equipment were decontaminated prior to each sampling event. All soil samples collected for this project were screened in the field for the VOCs using a portable gas analyzer equipped with a photo-ionization detector (PID). Field screening results are summarized in Table 1. No elevated PID readings, discolored soil, or strong odors were encountered in any of the soil samples collected during our subsurface investigation.

Based on field screening results, a total of 11 discrete soil samples were selected for laboratory analysis. Since our observations and field screening results did not detect obvious soil contamination, soil samples collected near the surface or at the soil-water interface were selected for laboratory analysis.

Soil samples collected for this project were transferred to clean laboratory-provided glassware with Teflon-lined lids. The sample jars were labeled with date, time, site location (SBL), soil boring number, and sample depth. For example, sample SBL-SB-04-3-4 was collected from soil boring SB-04 at the 3-4 foot bgs depth interval. All soil samples were placed in an ice-chilled cooler and transported to the laboratory under EPA-recommended chain-of-custody protocol.

**Laboratory Analysis of Soil Samples** - Soil samples were submitted to CCI Analytical Laboratories of Everett, Washington, and analyzed for one or more of the following COPC:

- Diesel and oil range total petroleum hydrocarbon (TPH) using Ecology Test Method NWTPH-Dx with silica gel cleanup<sup>2</sup>;
- Gasoline TPH with benzene, toluene, ethylbenzene and total xylenes (BTEX) using Ecology Test Method NWTPH-G/BTEX;
- Halogenated volatile organic compounds (HVOCs) by EPA Method 8260;
- Semivolatile organic compounds (SVOCs) using EPA Method 8270;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082 Modified; and
- Total Resource Conservation and Recovery Act (RCRA) 8 metals (including hexavalent chromium using the EPA Method 6010/7000 Series.

<sup>2</sup> Silica gel cleanup is performed prior to laboratory analysis to remove any naturally occurring biogenic material that interfere with TPH results.